BEFORE THE STATE OF WASHINGTON

ENERGY FACILITY SITE EVAUATION COUNCIL

In the Matter of Application No. 2004-01: WIND RIDGE POWER PARTNERS, LLC; WILD HORSE WIND POWER PROJECT	EXHIBIT 33 (TP-T)

APPLICANT'S PREFILED DIRECT TESTIMONY
WITNESS # 14: THOMAS PRIESTLEY

Q Please state your name and business address.

A My name is Thomas Priestley and my business address is 155 Grand Ave. Suite 1000, Oakland, CA 94612.

Q What is your present occupation, profession; and what are your duties and responsibilities?

A I am employed by CH2M Hill. CH2M Hill provides environmental consulting services to organizations such Zilkha Renewable Energy. I assist those organizations in analyzing environmental impacts of projects such as the Wild Horse Wind Power Project. I am a Senior Environmental Planner for CH2M Hill. My duties regarding the proposed project were to assess the aesthetic and light and glare impacts of the project, develop recommendations to

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minimize visual impacts, and assist in the preparation of the Application for Site Certification for this Project.

Q Would you please identify what has been marked for identification as Exhibit 33-1 (TP-1).

A Exhibit 33-1 (TP-1) is a résumé of my educational background and employment experience.

Q Are you sponsoring any portions of the "Application for Site Certification?

A Yes. I am sponsoring the following sections for which I was primarily responsible for the analysis and development:

Section 1.6.9 Summary, Cumulative Impacts, Visual Resources

Section 3.11 Visual Resources/Light and Glare

Section 3.17.14 Cumulative Impacts, Visual Resources

Q What exhibits that are part of the Application that you are sponsoring?

A I am sponsoring the following exhibits to the Application:

Exhibit 18A Visual Viewpoint Location Map

Exhibit 18B Visual Simulation

Exhibit 18C Potential Visual Impact in the Region (ZVI)

Exhibit 18D Night Lighting Photo Sample

Q Are there any other similar exhibits that are not part of the Application that you would like to introduce into evidence with this testimony?

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A Yes. Exhibit 33-2 (TP-2) (Figure 3.16-1 – Overview of Wind Power Projects Proposed In Kittitas County of the EFSEC Wild Horse Wind Power Project DEIS) is a map prepared under my direction using a USGS topographic map as a base that shows the locations of the Kittitas Valley, Desert Claim, and Wild Horse wind power projects, the distances between them, and their relationship to nearby communities and major highways.

Q Do the visual simulations in the Application and the exhibits attached hereto accurately portray what they purport to represent?

A Yes.

Q Are you familiar with these sections of the Application and Exhibits?

A Yes

Q Did you prepare these sections and exhibits, or, if not, did you direct and/or supervise their preparation?

A Yes.

Q Is the information in these sections and exhibits within your area of authority and /or expertise?

A Yes

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Q Are the contents of these sections and exhibits of the Application either based upon your own knowledge, or upon evidence, such as studies and reports as reasonably prudent persons in your field and expertise are accustomed to rely in the conduct of their affairs?

A Yes.

Q To the best of your knowledge, are the contents of these sections and exhibits of the Application true?

A Yes.

Q Do you incorporate the facts and content of these sections and exhibits as part of your testimony?

A Yes.

Q Are you able to answer questions under cross examination regarding these sections and exhibits?

A Yes

Q Do you sponsor the admission into evidence of these sections and exhibits of the Application?

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A Yes

Q Are there any modifications or corrections to be made to those portions of the Application that you are sponsoring?

A No

Q Would you please summarize and briefly describe your evaluation of the visual impacts resulting from the construction an operation of the project.

A Introduction and Analysis Approach:

In environmental planning and analysis, visual or aesthetic resources are generally thought of as being the natural and developed features of the environment that are seen and enjoyed by the public. Visual resource or aesthetic impacts are usually defined in terms of a project's physical characteristics and potential visibility, and the extent to which the project's presence would change the perceived visual character and quality of the environment in which it is located. The provisions of the Washington Administrative Code pertaining to applications to EFSEC require that the applicant "…shall describe any scenic resources which may be affected by the facility…" (WAC 463-42-342 (3)) and "…shall describe the aesthetic impact of the proposed energy facility and associated facilities and any alteration of surrounding terrain." (WAC 463-42-363 (4)).

To respond to EFSEC's requirements in this area, I drew on a set of well-developed and accepted analytic procedures and tools for conducting the necessary analyses. To a large degree, these procedures and tools were developed under the aegis of Federal agencies

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such as the Bureau of Land Management, the US Forest Service, and the Federal Highway Administration in response to the requirements of the National Environmental Policy Act of 1969. NEPA, as this legislation is known, mandates the "…Federal Government to use all practicable means…[to]…assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings…" (NEPA sec. 101 (b)) and directs Federal agencies to "…utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and decision making which may have an impact on man's environment" (NEPA sec. 102(a)). To fulfill these requirements, a number of Federal agencies devoted considerable time and resources to conducting research and developing methods that would provide a sound basis for assessing the environment's aesthetic qualities and evaluating how those qualities would be affected by proposed changes brought about by land management decisions and development projects.

The methods developed by these agencies share many common elements, and the basic principles of the methods have been widely adopted in the environmental planning profession as the basis for identifying landscape visual resource qualities and assessing the effects of proposed changes on them. What these methods do is provide a systematic process for identifying the area potentially affected by a proposed project or action, inventorying its aesthetic qualities and sensitivities, documenting the visibility and character of the proposed changes, and assessing how and the extent to which those changes would affect the character and quality of the existing visual setting. The way in which I applied these methods to evaluate the aesthetic effects of the Wild Horse Wind Power Project is described briefly below.

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One of the first steps in the process was to define the Project viewshed, that is, the area from which the Project's facilities would be potentially visible. To do so, I directed my colleagues at Wind Engineers to use the "Zones of Visual Influence" (ZVI) feature of the WindPro software system, a sophisticated program developed to assist in the planning, design, and environmental assessment of wind energy projects (EMD 2002). To identify the areas from which the turbines are potentially visible, the ZVI module makes use of a digital height model generated from digital height contour lines. The software calculates lines of sight between each point on the land surface and the tops of each of the proposed turbines, and notes whether there is an unobstructed view toward the turbine based solely on terrain. The products of this analysis were a map (Exhibit 18-c) that indicated the potential visibility of the proposed turbines in the surrounding region. Because this analysis was run using topographic data only, and did not take into account the screening of views provided by vegetation and buildings, the patterns of Project visibility displayed on this exhibit represent the maximum potential visibility of the turbines and thus likely overstates the extent to which the turbines will actually be visible.

For the area within the Project's potential viewshed, I conducted research that included review of local planning documents, topographic maps, and aerial photos, and made field visits that included photo documentation of existing conditions. Based on this research, the Project area was divided up into a number of viewing areas – areas which offer similar kinds of views toward the Project site and/or within which there would likely be similar concerns about landscape issues. Within most of these viewing areas, I selected Simulation Viewpoints (SVs) as locations for taking photos that could be used for the development of simulated views of the Project which could then form the basis for visualizing the Project's potential visual effects. The simulation viewpoints were

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established to capture views that are typical of the conditions that exist in each of the viewing areas. The emphasis was placed on views from publicly accessible locations that would be likely to be seen by the largest numbers of people. A total of 6 simulation viewpoints were documented as a part of the process of preparing the EFSEC application.

For each of the viewpoints used for analysis and the preparation of simulation images, I documented existing viewing conditions and made an assessment of the view's existing scenic quality. The final assessment of scenic quality was made based on professional judgment that took a broad spectrum of factors into consideration, including:

- Natural features, including topography, water courses, rock outcrops, and natural vegetation;
- The positive and negative effects of man-made alterations and built structures on visual quality; and
- Visual composition, including an assessment of the vividness, intactness, and unity of patterns in the landscape.[1]

The final ratings assigned to each view fit within the rating scale summarized in Table 3.11.2.1 in the Application for Site Certification (ASC). This scale is based on a scale developed for use with an artificial intelligence system for evaluation of landscape visual quality (Buhyoff et al., 1994), and incorporates landscape assessment concepts applied by the U.S. Forest Service and the U.S. Department of Transportation. The scale defines six classes of scenic quality, ranging from "Outstanding Scenic Quality" (landscapes with exceptionally high scenic quality that are significant nationally or regionally) at one end

[1] These terms are defined in the 'Technical Terms' section at the end of Chapter 5 in the Project's EFSEC Application.

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of the spectrum, to "Low Visual Quality" (landscapes that are below average in scenic value, which may contain visually discordant alterations) at the other end.

In addition to assessing the existing quality of each view, I also documented the sensitivity of each view in terms of the numbers of viewers and their sensitivity. Residential viewers, roadway viewers, and recreational viewers were assumed to be the most potentially sensitive to the project's visual effects. Overall levels of visual sensitivity at each of the viewpoints were identified as being High, Moderate, or Low. In general, high levels of sensitivity were assigned in situations where turbines would be potentially visible within 0.5 mile or less from residential properties (there are no such cases at this Project), heavily traveled roadways, or heavily used recreational facilities, based on the presumption that sensitive viewers in these areas would be highly likely to notice and pay attention to landscape modifications in their close range views. Moderate levels of sensitivity were assigned to areas where turbines would be potentially visible within 0.5 to 5 miles within the primary view cone of residences and roadways. In distinguishing between moderate and low levels of sensitivity in the 0.5 to 5 mile zone, account was also taken of contextual factors, including the viewing conditions in the immediate foreground of the view. In areas lying 5 miles or more from the closest turbine, where turbines would be distant and relatively minor elements in the overall landscape and would be less likely to be noticed, a low level of sensitivity was assigned. The distance thresholds applied in defining the varying levels of potential sensitivity derive from the landscape visual analysis systems developed by the US Forest Service and other agencies, which divide the landscape up into distance zones that are related to the degree to which landscape details are detectable to the viewer. The foreground distance zone is defined as the area within ¼ to ½ mile from the viewer, where the

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maximum discernment of detail is possible. The middle ground is defined as the area from ¼ to 3 to 5 miles from the viewer, where there is visual simplification of vegetative surfaces into textures, overall shapes and patterns, and there is linkage between foreground and background parts of the landscape. The background is defined as the landscape zone 3 to 5 miles and further from the viewer in which little color or texture is apparent, colors blur into values of blue or gray, and individual visual impacts become least apparent (USDA Forest Service 1973, pp. 56-57).

To provide a basis for the assessment of the Project-related visual changes, for each viewpoint, the photo of the existing view was used as the basis for the preparation of a simulation of the view as it would appear with the development of the Project. These "before" and "after" images were then compared to provide an understanding of how, and the degree to which, the presence of the Project would change the view. The computer-generated simulations were the result of an objective analytical and a computer modeling process, and are accurate within the constraints of the available site and Project data. The simulations were created using the Photomontage module of the WindPro software program (a widely accepted and applied program used for planning and assessing wind generation projects). Existing topographic and site data provided the basis for developing an initial digital model. The Applicant provided site plans and digital data for the proposed wind turbines. These were used to create three-dimensional (3-D) digital models of these facilities. These models were combined with the digital site model to produce a complete computer model of the wind farm. For each viewpoint, viewer location was digitized from topographic maps, using 5 feet as the assumed eye level. The WindPro program overlaid computer "wire frame" perspective plots on the photographs of the views from the Simulation Viewpoints to verify scale and viewpoint location.

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Digital visual simulation images were produced as a next step based on computer renderings of the 3-D model combined with high-resolution digital base photographs. The final "hardcopy" visual simulation images that were provided in the Applicant's EFSEC application were produced from the digital image files using a color printer.

In comparing the "before" and "after" views from each viewpoint, consideration was given to the following factors in determining the extent and implications of the visual changes:

- The specific changes in the affected visual environment's composition, character, and any specially valued qualities;
- The affected visual environment's context;
- The extent to which the affected environment contains places or features that have been designated in plans and policies for protection or special consideration; and
- The relative numbers of viewers, their activities, and the extent to which these activities are related to the aesthetic qualities affected by the expected changes. Particular consideration was given to effects on views identified as having high or moderate levels of visual sensitivity.

Levels of impact were classified as high, moderate, and low. In general, high levels of aesthetic impacts were assigned in situations in which turbines would be highly visible in areas with sensitive viewers, and would alter levels of landscape vividness, unity, and intactness to the extent that there would be a substantial decrease in the existing level of visual quality. Moderate levels of aesthetic impact were assigned in situations in which turbines would be visible in areas with high levels of visual sensitivity in which the presence of the turbines would alter levels of landscape vividness, unity and intactness to

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the extent that there would be a moderate change in existing visual quality. Moderate levels of visual impact were also found in situations in which the presence of turbines in the view would lead to more substantial changes in visual quality, but where levels of visual sensitivity were moderate to low. Low levels of visual impact were found in situations where the Project would have relatively small effects on overall levels of landscape vividness, unity, and intactness and/or where existing levels of landscape aesthetic quality are low or where there are low levels of visual sensitivity.

Description of the Existing Visual Setting:

The lands on which the Wild Horse Wind Power Project is sited extend across a roughly 4 mile by 5 mile area located in the upland areas on and to the immediate north of Whiskey Dick Mountain, a 3,873 foot high ridge located approximately 14 miles to the east of the City of Ellensburg, and 9 miles east of the town of Kittitas. Whiskey Dick Mountain is a small part of a large region of ridgelands that frames the eastern edge of the Kittitas Valley, and separates it from the Columbia River to the east.

The Project area has an open, windswept appearance. Most of the ridge tops on which the Project facilities would be located consist of dry, rocky grasslands used for grazing, and areas covered with a mixture of sagebrush bitterbrush, and bunchgrasses. In scattered locations in draws and adjacent to springs, there are small clusters of ponderosa pines. Most of the Project site is a portion of a much larger (~25,000 acres) private ranch property, and it also includes four sections of land that belong to the Washington Department of Natural Resources and one section that belongs to the Washington Department of Fish and Wildlife. The property is not crossed or bordered

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by any public roads. The closest public roadways are Vantage Highway, which lies a minimum of 1.3 miles south of the Project area's southern boundary, and Parke Creek Road, which lies a minimum of 4.0 miles from the Project area's western perimeter. The only access into the Project area is by way private gravel roads, and over which the public does not have the right to pass. On the Project site and on the larger ranch parcel of which it is a part, there are no residential or agricultural structures. The only structures on the site consist of the collection of antennae at the communication facility on Cribb Peak, a 3,558 foot elevation peak in the eastern portion of the ridge formed by Whiskey Dick Mountain, and several temporary meteorological test towers at locations scattered across the Project site. The safety lighting on these communications structures is also the only lighting in the area.

Large portions of the eastern slopes of the ridge area, of which Whiskey Dick Mountain is a part, are wildlife lands administered by the Washington Department of Fish and Wildlife as the Whiskey Dick and Quilomene units of the L. T. Murray Wildlife Area. These wildlife lands generally consist of steep, rocky slopes and narrow, riparian bottoms vegetated with sagebrush and bitterbrush, mixed with various bunchgrasses. The purpose of these wildlife lands is to provide habitat for the Colockum elk herd, as well as for mule deer and other wildlife. There are no developed uses on these lands, and the only access is by a system of rough, unpaved roads. Gingko Petrified Forest State Park is a 7,470 acre state park that lies to the immediate east of the Whiskey Dick unit of the L.T. Murray Wildlife area, and encompasses lands located on both the northern and southern sides of I-90. The park was established in the 1930's to protect the large area of both exposed and buried petrified wood located within its boundaries. Most of the land in the park is

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undeveloped, and managed either as grazing land or as undisturbed shrub-steppe landscape. Developed park facilities are concentrated at the Wanapum Recreation Area, which lies along the Wanapum Reservoir on the Columbia River in the area south of I-90, where there are a boat ramp, picnic, and swim area, and 50 camp sites; at the Heritage Area just north of Vantage, where there is an interpretive center and picnic area; and at the Natural Area located along the north side of the Vantage Highway, two miles west of Vantage, where there is a 2.5 mile trail system that includes a 1.5 mile interpretive trail.

Under the Kittitas County Comprehensive Plan (Kittitas County 2001) and Zoning Ordinance, the lands on the Project site have been zoned as Forest and Range and as Commercial Agriculture. The Comprehensive Plan does not acknowledge any special scenic or visual resource values in the Project area, and does not include any policies that are specifically oriented to protection of Project area scenic qualities. Inquiries with the Washington Department of Natural Resources (Beach 2003) and the Washington Department of Fish and Wildlife (Clausing 2003) revealed that these two agencies do not have adopted plans for their lands in and around the project site that identify scenic resources on these lands or that include policies to protect these lands' scenic qualities.

Within the area from which the project's features are potentially visible, six viewing areas were defined. These areas are defined and described section 3.11.2.6 of the EFSEC Application. The visual conditions in these areas are represented by views from the 6 viewpoints whose locations are indicated on the map presented as Exhibit 18A. Photos of the existing views seen from these viewpoints are provided in Exhibit

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18B. The visual quality of the views from these viewpoints ranges from moderate to moderately high to high.

Description of the Project's Appearance:

The Project will include up to 158 turbines. The turbines will be mounted on tubular steel towers that will be approximately 18 feet in diameter at the base and will rise to a hub height of up to 262 feet. Each tower will support a nacelle that houses a drive train, gearbox, generator, and other generating equipment. The nacelles will be approximately 30 to 37 feet long, 10 to 11 feet wide and 10 to 12 feet high. The nacelles will be completely sheathed in an aerodynamically shaped fiberglass or metal shell. The rotors will be attached to the front of the nacelles, which are mounted on the tops of the towers. The rotors will have three blades, and will have a diameter of 197 feet to 295 feet. Although not required for functionality, each rotor will have an aerodynamic appearing nose cone to improve its appearance. The dimensions provided here represent the entire range of sizes of the various turbine models being considered for this Project. The Applicant is considering several turbine models from different vendors. The final decision regarding turbine and tower dimensions is driven largely by Project economics such as turbine pricing and the performance of specific turbines under different wind conditions. The primary difference among the turbine models being considered is the rotor diameter, which could range from 197 feet to 295 feet. Most of the visual simulations presented in the accompanying exhibits are based on a turbine with a hub height of 213 feet and a rotor diameter of 236 feet, which are representative of the dimensions of the turbines that are being considered for the Project. For two of the simulation views, simulations are provided of the turbines with dimensions at the high and low ends of the

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dimension range (Exhibits 18-B, Figures 2c and 2d and Figures 4c and 4d) to permit the appearance of the slightly larger and slightly taller turbines being considered to be compared with that of the turbines most likely to be used, which have been simulated in all the views. The surfaces of the turbine towers, rotors, and nacelles will be neutral gray in color and will be given a finish that has a low level of reflectivity. Data from the turbine manufacturers indicates that the turbines and nacelles will be coated with a semi-gloss material and that the two products available for this purpose have gloss ratings of 70% and 75%. The rotors will be made of materials similar to those used for rotors on turbines installed in other wind generation facilities developed recently in Washington, and as is the case with the existing turbines, the rotors on the planned turbines will not have surfaces that are highly reflective. Over time, the surfaces of the turbine equipment, like any coated surface exposed to the elements, will tend to weather, and the effect of this weathering will be to dull the surfaces, producing further decreases in the levels of reflectivity.

The power generated by the turbines will be delivered to the Project substation by means of a largely underground electric collection system. Small, pad-mounted transformers located at the base of each turbine tower will convert the electricity produced by the turbine to a collection voltage of 34.5 kV and will connect to the underground collection lines. Each of the transformers will be housed in a metal-sided case that is approximately 8 feet wide, 8 feet long, and 8 feet high. The transformer housings will be painted in earth tone colors using paint with a low-reflectivity finish. An approximately 2 mile long segment of the collection system connecting the northern and southern portions of the Project will be above ground due to the large amount of power flowing through this portion of the collection

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system, as indicated in Exhibit 1B, Project Site Layout. The first proposed collector line begins at a point at the north end of String E, and would extend to the site of the proposed PSE step-up substation located just west of String H. This portion of the collection system would be carried on single wood poles with dual cross arms that are 40 to 60 feet tall. Because this line would be located in an area that lies to the north of the high ridgeline formed by Whiskey Dick Mountain, it would not be visible from areas lying to the south and west. The network of roads that will provide access to each of the turbines will consist of both existing and new roads which will have a compacted gravel surface and a width of 20 feet where possible and 34 feet in other areas (approximately half the road miles will be 20 feet wide and the other half will be 34 feet wide). In areas with steeper slopes, cutting and filling will be required to keep grades below 15%. The proposed operations and maintenance (O&M) facility will be located on a flat area east of the crest of Whiskey Dick Mountain near turbine E1. To construct this O&M facility, the existing shrub-steppe vegetation on the site will be cleared and the site will be graded and fenced. The primary structure in the O&M facility will be a main building that is approximately 50 feet wide, 100 feet long, and 35 feet high. This building will house offices, spare parts storage, and a shop area. This building will have siding that will be painted with low reflectivity paints in earth-tone colors that blend well with the surrounding landscape. The outdoor areas devoted to parking and vehicle turning will be covered with gravel to minimize dust and runoff. A small visitor kiosk with interpretive information panels is planned for a site located on a small, flat plateau located approximately 0.1 mile north of Vantage Highway and along the west side of the road that will provide access from Vantage Highway into the Project site. Two sites have been proposed as locations for step-up substations. The site for the substation that would transform

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power for transmission to the Bonneville Power Authority grid would be located in the plateau area north of the ridgeline formed by Whiskey Dick Mountain in the area near String J. The site for the substation that would step up power for transmission to the PSE system would also be located in the plateau area, but at a location further south, near String H. It is possible that either or both of these sites would be developed. In either case, the substation(s) would occupy an area of 2 to 3 acres that would need to be cleared and graded. The primary elements of a substation on either site would include outdoor control cabinets, large transformers, structures housing switchgear, bus work, steel support structures, lightning suppression lines, outdoor lighting, and a perimeter chain link fence. The tallest structures would be the steel support structures, which would be on the order of 60 feet high. The bus work would be in the range of 40 to 45 feet high. The transformers, switchgear structures, and control building would be no more than 15 to 20 feet in height. Although the substation control cabinets would be painted an earth-tone color using low-reflectivity paints, the substation equipment would have a standard low reflectivity neutral gray finish. Both step-up substations are located north of Whiskey Dick Mountain which shields them from visibility from main public roadways including Vantage Highway and I-90.

To respond to the Federal Aviation Administration's (FAA) aircraft safety lighting requirements, the Project will be marked according to guidelines established by the FAA. At present, FAA guidelines for lighting of wind turbines call for lights that flash white during the day (at 20,000 candela) and red (at 2,000 candela) at night. These lights are designed to concentrate the beam in the horizontal plane, thus minimizing light diffusion down toward the ground and up toward the sky. The exact

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number of turbines that will require lighting will be specified by the FAA after it has reviewed final Project plans; however, typically, FAA has required that warning lights be mounted on the first and last turbines of each string, and every 1000 to 1400 feet on the turbines in between. Aside from any required aircraft warning lights, the turbines will not be illuminated at night. The FAA is now in the process of reviewing its safety lighting standards for wind energy facilities and is in the process of developing revised requirements. The research that the FAA has undertaken as a part of this review suggests that the revised requirements are likely to go in the direction of requiring fewer lights that could be located further apart (Patterson 2003).

At the O&M facility and substation(s), outdoor night lighting will be required for safety and security. This lighting will be restricted to the levels required to meet safety and security needs. Sensors and switches will be used to keep lights turned off when not required. All lights will be hooded and directed to minimize backscatter and illumination of areas outside the O&M and substation sites.

Project construction is expected to take place over a period of approximately 9 to12 months. During that time, temporary laydown areas will be set up near turbine E1 on the ridge line of Whiskey Dick Mountain and at several locations in the plateau area to the north. The laydown areas will be used for temporary storage of turbine components, equipment, and vehicles. Grading will be required to create access roads and 30 by 60-foot flat, gravel-covered areas at the base of each tower site that will accommodate the cranes required to erect the turbines.

Project Impacts:

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During the construction period, large earth moving equipment, trucks, cranes, and other heavy equipment will be highly evident features in views toward the Project site from nearby areas. At some times, small, localized clouds of dust created by road-building and other grading activities may be visible at the site. Because of the construction-related grading activities, areas of exposed soil and fresh gravel that contrasts with the colors of the surrounding undisturbed landscape will be visible. My analysis and the analysis presented in EFSEC's DEIS come to similar conclusions about the Project's construction period impacts. In close-at-hand views, which, for this Project, would be limited to those views from nearby segments of Vantage Highway, the visual changes associated with the construction activities will be moderately to highly visible and will have a moderate level of visual impact. From more distant viewing locations, the visual effects will be relatively minor and will have little or no impact on the quality of views. From the middleground areas with the greatest numbers of viewers, i.e. the areas to the south and west, much of the area in which construction activities will be taking place will not be visible because it will be hidden behind the ridgeline formed by Whiskey Dick Mountain. It is important to note that because construction activities take place over a period of only 9 to 12 months, the construction impacts will be relatively short in duration. After construction, is complete, all construction-related debris will be removed from the site and areas disturbed during construction will be reseeded with an appropriate seed mix to recreate the appearance of their original vegetative cover.

The Project's aesthetic impacts during the operational period are summarized in the Application for Site Certification in Table 3.11.3-1. My analysis and the analysis presented in EFSEC's DEIS concur that from two of the analysis viewpoints from

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which the Project's turbines would be visible, the level of visual impact would be low, and that from three of the viewpoints from which the turbines would be visible, the level of visual impact would be moderate.

From Simulation Viewpoint 1 along Vantage Highway, 0.4 mile east of the Project site access road (Exhibit 18B Figures 1a, 1b, and 1c), a total of 43 turbines will be visible along the ridgeline and southern slopes of Whiskey Dick Mountain at distances ranging from 1.9 to 4.1 miles. The Project will result in a highly noticeable change in this view, adding a large number of tall turbines and several smaller project elements to a scene that is now generally rural in character. Although the appearance and character of this view will be changed, the overall level of visual impact will be less than significant as the view's level of visual sensitivity is moderate at most. And although the view's moderately high level of visual quality may be decreased to some extent, the decrease will not be substantial because the landscape's topography and vegetative cover will remain essentially intact, and because the vividness of the view will be increased. The overall level of visual impact will be moderate.

From Simulation Viewpoint 2 located at Vantage Highway and Parke Creek Road (Exhibit 18B, Figures 2a and 2b), a total of up to 43 turbines will be visible running along the top of and on the upper slopes of the ridgeline of Whiskey Dick Mountain. The closest of these turbines will be 4.5 miles away, and the furthest will be 7.6 miles away, placing all of the turbines in the far middleground and background zones of the landscape. Although the turbines will be silhouetted against the sky because of their location along the ridgeline, the degree of visual contrast and visual salience will be moderate because of their distance from the viewer and because of their light color.

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The presence of the turbines will reduce the scene's degree of intactness to some extent by introducing highly engineered vertical elements into a landscape that now has a rural and natural appearance. Because the line of turbines extending along the ridgeline will have an orderly appearance, the overall effect on the visual unity of the scene's composition will not be substantial. In addition, the presence of the string of turbines that accentuates the ridgeline could be thought of enhancing the vividness of this view. The overall level of visual impact on this view will be moderate, and the level of impact will be less than significant.

From Simulation Viewpoint 3, which captures the views from the rangeland located north of the Project site in Section 32, Township 19 North, Range 21 East, over 100 turbines will be visible on the high elevation plateau that extends southward to the ridgeline of Whiskey Dick Mountain at distances that range from 2.8 to 7.8 miles. The large number of visible turbines spread across the landscape in this view will have an adverse effect on the landscape's degree of unity and intactness, decreasing its overall level of landscape quality. However, because of the relatively small numbers of viewers the overall visual impact will be moderate. Nineteen of the turbines will be located on two sections that encompass ridgelines along upper Whiskey Dick Creek that are a part of the Whiskey Dick Wildlife Area. To the extent that hunters or other users of the wildlife area are on or near these sections, the landscape that they experience will be substantially altered, with turbines and other Project-related facilities visible in the immediate foreground. Although the character of the landscape in these areas will be transformed, and the existing visual quality reduced to some degree, the level of impact will be less than significant because of

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the moderate visual sensitivity of these lands, which are being managed primarily for their wildlife values rather than their scenic qualities.

From Simulation Viewpoint 4 (Exhibit 18B, Figures 4a and 4b), which is located at the edge of the community of Kittitas, approximately 30 turbines will be visible running in a line along the distant ridgeline of Whiskey Dick Mountain. The closest of these turbines will be 8.3 miles away, and the furthest will be over 11 miles away, placing all of the turbines well into the background landscape distance zone. The turbines that will be visible will all be silhouetted against the sky, but, because of their great distance and because of their light color, the degree of visual contrast will be low. However because of their scale and form, they will have a moderate degree of visual salience. The presence of the turbines will reduce the scene's degree of intactness to some extent by introducing vertical elements along a distant ridgeline that now has a natural profile, but the degree of change will be limited by the fact that the turbines will be so far away and will be secondary elements in the overall view. The effect on the scene's visual unity will also be attenuated by the fact that the turbines will be so far away; in addition, the effect on the scene's degree of visual unity will be minimized because the line of turbines extending along the ridgeline will have an orderly appearance. The overall level of visual impact on this view will be low.

Simulation Viewpoint 5 (Exhibit 18B, Figures 5a and 5b) is a view from east side of the Columbia River, from I-90 at a point west of Silica Road. From this viewpoint, over 100 turbines will be seen spread across the upper slopes of the ridgeline in the far distance of the view. All of the turbines will be in the range of 9 to 13 miles in the

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distance, placing all of them well into the landscape's background zone. The effect of the turbines on this view will be greatly attenuated by the fact that they are located so far in the distance. Under hazy atmospheric conditions, their degree of noticeability is likely to be particularly low. The presence of the turbines will reduce the scene's degree of intactness to small degree by introducing vertical elements along a distant ridgeline that now has a natural profile. The turbines will also have a small effect on the view's level of unity and intactness. The overall level of visual impact on this view will be low.

These assessments of the Project's visual impacts are based on simulations depicting the turbines that are most likely to be used, which would have towers that would be 213 feet high at hub-height. For two of the viewpoints, additional simulations were prepared to illustrate the project's appearance if turbines that are larger (262 feet to hub height) or smaller (197 feet to hub height) were to be used. For Simulation Viewpoint 2, Exhibit 18B, Figure 2c depicts the view as it would appear under a scenario in which in which 262 foot hub-height towers would be used, and Exhibit 18-B, Figure 2d is a simulation of the project's appearance assuming towers 197 feet at hub-height. For simulation Viewpoint 4, Exhibit 18-B, Figure 4c depicts the scenario with 262 foot hub-height towers, and Exhibit 18-B, Figure 4d depicts the scenario with 197 foot hub-height towers. In both views, comparison of the simulations of turbines with the larger and smaller towers to each other and to the simulations of the turbines with 213 foot hub-height towers (which are most likely to be used) indicates that in these viewing contexts, and at the viewing distances involved, the overall visual effects of the three scenarios are not significantly different.

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Based on experience at the operating Stateline and Nine Canyon wind power projects in Washington, it appears that the white flashing lights that will be mounted on the turbines and flash during daylight hours as required by the FAA for daytime aircraft safety will be visible, but not particularly intrusive to viewers in the areas surrounding the Project. They are thus unlikely to create a moderate or high level of visual impact. The flashing red lights (2,000 candela) that the FAA requires be operated at nighttime will introduce a new element into the Project area's nighttime environment. At present, the Project site and immediately surrounding area are dark at night except for the lighting present at the set of communications towers on Cribb Peak near the eastern end of Whiskey Dick Mountain's ridgeline. Because the nighttime aircraft safety lights will be limited in number, red, and highly directional, their potential to create skyglow or backscatter will be minimal.

Exhibit 18-D is a nighttime photo taken at the Nine Canyon Wind Power Project in Benton County, Washington to illustrate the night lighting conditions that are typical at existing large wind power projects in the region. This photo was taken at a distance of about one mile from the closest turbine string at the location indicated on the map in Exhibit 18-D. The cluster of lights on top of the ridgeline at the right side of the photo is the night lighting at a radio tower complex that is not a part of the wind energy project. The remaining visible lights are the red aircraft safety lights associated with the project's turbine strings. These lights are visible as small blinking points of light. As this photo suggests, these lights do not light up the sky or the surrounding landscape. The flashing red lights associated with the Wild Horse Project will be most noticeable in the areas within a mile or so of the Project, but because

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there are no residences or public roads in these areas, the impacts on potential viewers will be negligible

The Project's O&M facility and substation(s) will create sources of light in areas where there are currently no nighttime sources of light. However, the impacts of the lighting associated with these facilities will not be substantial. Because of their location to the north of Whiskey Dick Mountain's ridgeline, where they will be screened in most views toward the Project site, the minimal night lighting associated with them will have no effect on most views. The one exception is the view into the plateau area from the area to the north of the site along upper Parke Creek Road. However, because of the viewing distance toward these facilities from this area (four miles or more) and the minimal amount of lighting involved, the degree of impact will be minor. Mitigation measures will be implemented to restrict the substation and O&M facility lighting to the minimum required and to attenuate its effects. High illumination areas not occupied on a regular basis will be provided with switches or motion detectors to light these areas only when occupied. At times when lights are turned on, the lighting will not be highly visible offsite and will not produce offsite glare effects because lighting will be restricted by specification of non-glare, hooded fixtures, and placement of lights to direct illumination into only those areas where it is needed. With these measures to restrict lighting at the O&M facility and substation(s) to the minimum required, and to assure that it is appropriately hooded and directed downward into the areas where it is needed, the potential for it to create skyglow (brightening of the night sky) or backscatter (reflection of skyglow back toward the ground by moisture or dust in the atmosphere) will be limited.

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Mitigation Measures:

Mitigation measures that have been made an integral part of the Project's design include:

• During the construction period, active dust suppression will be implemented to minimize the creation of dust clouds;

• When construction is complete, areas disturbed during the construction process will be reseeded to facilitate their return to natural appearing conditions;

• The wind turbine towers, nacelles, and rotors used will be uniform and will conform to the highest standards of industrial design to present a trim, uncluttered, aesthetically attractive appearance;

• The turbines will have neutral gray finish to minimize contrast with the sky backdrop.

• A low-reflectivity finish will be used for all surfaces of the turbines to minimize the reflections that can call attention to structures in a landscape setting;

• The small cabinets containing pad-mounted equipment that will be located at the base of each turbine will have an earth-tone finish to help them blend into the surrounding ground plane;

• The only exterior lighting on the turbines will be the aviation warning lighting required by the FAA. It will be kept to the minimum required intensity to meet FAA standards. It is anticipated that the FAA will soon be issuing new standards for marking of wind turbines that will entail lighting far fewer turbines in a large wind farm than is now required, and having all the lights be synchronized. These potential regulatory changes are being closely monitored, and if, as is likely, they are made before Project construction begins, the aviation safety marking lighting will be designed to meet these new standards;

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• Nearly all of the Project's electrical collection system will be located underground, eliminating visual impacts;

• To the extent feasible, existing road alignments will be used to provide access to the turbines, minimizing the amount of additional surface disturbance required. Where possible, access road widths will be restricted to 20 feet (approximately half of all access road miles.) The access roads will have a gravel surface and will have grades of no more than 15%, minimizing erosion and its visual effects;

• The O&M facility building will have a low-reflectivity earth-tone finish to maximize its visual integration into the surrounding landscape;

• The parking areas at the O&M facility will be covered with gravel, rather than asphalt, to minimize contrast with the site's soil colors;

• Outdoor night lighting at the O&M facility and the substation(s) will be kept to the minimum required for safety and security, sensors and switches will be used to keep lighting turned off when not required, and all lights will be hooded and directed to minimize backscatter and off-site light trespass;

• At the substation(s), all equipment will have a low reflectivity neutral gray finish to minimize visual salience;

• All insulators in the substations and on takeoff towers will be non-reflective and non-refractive;

• The control buildings located at each substation will have a low-reflectivity earth-tone finish;

• The chain link fences surrounding the substations will have a dulled, darkened finish to reduce their contrast with the surroundings;

Cumulative Impacts:

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Exhibit 33-2 (TP-2) identifies the locations of the Kittitas Valley, Desert Claim, and Wild Horse wind power projects. As this figure indicates, the Kittitas Valley and Desert Claim projects are relatively close to each other, with a separation of just 1.6 miles at their closest point. The Wild Horse Project, however, is relatively far from both of these projects. The Wild Horse site lies 14 miles east of the Desert Claim project site and 21 miles east of the Kittitas Valley project site.

Because the Wild Horse Project is located so far from the other two projects and in an entirely different portion of the landscape, it has limited potential to be seen in the same view as the other two proposed wind power projects. It is conceivable that there are some locations at the western edges of, or within the Kittitas Valley and Desert Claim wind power project sites, from which there may be an unobstructed line of sight toward Whiskey Dick Mountain and the Wild Horse project site. However, because of the large distances involved (21 miles from the Kittitas Valley project and 14 miles from the Desert Claim project), the Wild Horse turbines would be barely, if at all, detectable and would have essentially no effect on the view.

Conclusion:

The Wild Horse Wind Power Project will add a number of tall, highly visible, new elements to the project area landscape. Although the Project would create substantial changes to the character, and, to a lesser extent, the quality of a number of views toward the Project site during the period of Project operation, these changes would not constitute significant impacts because of the low to moderate levels of visual sensitivity of the areas of the views in which they will be visible.

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